

IN THE DRAWINGS:

Please amend Fig. 4 as shown on the attached sheets (replacement sheet and annotated sheet).

The lead line for reference numeral 111 is corrected.

REMARKS AND DISCUSSION

Upon entry of the present Amendment, claims 1-12 are pending in the application, of which claims 1 and 9 are independent. Claim 1 has been amended herein. New claims 2-12 have been added herein.

The above-identified Office Action has been reviewed, the references carefully considered, and the Examiner's comments carefully weighed. In view thereof, the present Amendment is submitted. It is contended that by the present amendment, all bases of rejection set forth in the Office Action have been traversed and overcome. Accordingly, reconsideration and withdrawal of the rejection is respectfully requested.

Amendments

Claim 1 has been amended herein to remove the "means-plus-function" type language and reference numbers therefrom. Further, claim 1 has been amended herein to positively define the casing as a component of the parking brake system, and to further define that the casing has a hollow bore formed therein, that the parking piston is configured and arranged to move within the bore, that the opening in the casing is normally covered by a separate, detachable lid member, and that the tool is configured to be inserted through the opening from the outside of the casing and connected to the tool connection part to enable manual operation of the lock piston via the tool.

New claims 2 – 8 define further aspects of the parking brake system of claim 1, i.e.,

Claim 2 defines that the detachable lid member tool is a bolt screw fitted into the opening provided in the casing.

Claim 3 defines that the opening is provided in a rear end wall of the casing.

Claim 4 defines that the tool connection part comprises an internal thread on a rear part of an inner face of a communicating passage in the lock piston.

Claim 5 defines that one end portion of the tool is threaded for connection to the internal

thread on the rear part of the inner face of the communicating passage in the lock piston..

Claim 6 defines that the tool includes a handle which extends outwardly of the casing when the tool is connected to the tool connection part, and the handle is configured to be manually moved rearwardly to draw the locking piston rearward for releasing the parking brake state.

Claim 7 defines that the opening in the casing has a larger diameter than a diameter of the tool.

Claim 8 defines that a front face of the parking piston faces an air chamber defined within the casing; the spring is provided in a spring chamber formed between a rear face of the lock piston and the casing, a first communication passage communicating with the spring chamber extends axially through the lock piston, and a second communication passage communicating the first communication passage with the air chamber is provided in the parking piston, the opening provided in the casing communicates with the spring chamber, and the tool connection part is an internal thread formed on a rear part of an inner face of the first communicating passage.

New independent claim 9 is similar to claim 1 but further defines that wherein the tool is configured to be manually moved against the force of the spring to release the lock piston from the parking brake state; the lid member comprises a bolt; and one end of the tool is configured to be connected to the tool connection part.

Claim 10 defines that the tool connection part is formed in a passage extending through the lock piston that also acts as a communication passage between an air chamber and a spring chamber.

Claim 11 defines that a rear portion of the tool comprises a handle which is disposed outside of the casing when the tool is connected to the tool connection part, and the tool also comprises a front portion insertable into the opening to contact the connection part.

Claim 12 is similar to claim 8, but depends from claim 9.

The Abstract is amended by deleting reference numbers therein, while FIG. 4 is amended to

correct a minor informality / inconsistency, i.e., the lead line for reference numeral 111 of FIG. 4 has been corrected.

Applicant respectfully submits that all of such amendments are fully supported by the original disclosure, including the drawings. For example, the tool being inserted through a screw hole opening created by the loosening and removal of a bolt is taught at paragraph [0076] and Figs. 2 and 4 of the original specification, the screw hole opening is coaxially provided with a tool connecting part in an end wall of the casing is taught at paragraphs [0075]-[0076] and Figs. 2 and 4 of the original specification; the lock piston including a tool connection part, the tool connection part comprising an internal thread on a rear part of an inner face of a communicating passage in the lock piston is taught at paragraph [0076] of the original specification; that the tool when connected with the locking piston, forcibly releases the parking brake state by manual operation and that the tool pulls against the spring force of the spring to force the lock piston to move toward the parking brake release state is taught at paragraph [0091] of the original specification; that the tool is for maintenance and inspection of the brake system and the screw hole opening is normally covered by a bolt is taught at paragraphs [0076] and [0091] of the original specification; that the tool access is larger than the diameter of the tool is taught at paragraph [0076] of the original specification; that the tool includes matching threads on one end thereof that contact the tool connection part is taught at paragraph [0076] of the original specification; that the parking piston has a front face that faces an air chamber defined within the casing is taught at paragraph [0082] of the original specification; that the spring is provided in a spring chamber formed between a rear face of the lock piston of the casing is taught at paragraph [0057] of the original specification; a first communication passage communicating with the spring chamber is formed to extend through the lock piston axially, a second communication passage that makes the first communication passage communicate with the air chamber is provided in the parking piston, that the opening is open to the spring chamber, and that the tool connection part is formed by cutting an internal thread on a rear part of an inner face of

the first communicating passage is taught at paragraphs [0074]-[0076] of the original specification; that the tool connection part resides within a passage that also acts as a communication passage between an air chamber and a spring chamber is shown in Figs. 4 and 5; and that the tool comprises a handle portion outside of the casing when the tool is contacting the tool connection part a front portion insertable into the opening to contact the connection part is shown in Fig. 7. Applicant also respectfully submits that the amendments do not introduce any impermissible “new matter” into the application, as all of the subject matter of these amendments was expressly or inherently disclosed in the specification as originally filed.

Claim Rejections – 35 USC 103

At page 2 of the Office Action, the Examiner has rejected claim 1 under 35 USC 103(a) as obvious over JP (57-190903, hereinafter JP ‘903) in view of Shirey (US 4215767). It is the Examiner’s opinion that JP ‘903 discloses all of the claimed features except for the locking device and tool being used for a parking brake, and the Office Action states that it would have been obvious to use the JP ‘903 brake as a parking brake in view of the brake apparatus of Shirey.

Applicant’s Response

Upon careful consideration and in light of the above amendments to the claims, applicant respectfully traverses such rejection and submits that present claim 1 is patentably distinct over JP ‘903 and Shirey (whether considered singly or in combination) because neither JP ‘903 nor Shirey teach features required by claim 1, e.g., a tool connection part provided in a rear portion of the locking piston, which enables a tool to be inserted through an opening provided in the casing which can be detachably connected to the tool connection part, and because the proposed use / modification of the braking apparatus of JP ‘903 relative to the parking brake device of Shirey is improperly based on impermissible hindsight gained exclusively from applicant’s disclosure, rather than on any motivation or suggestion coming from the references themselves or from any other appropriate source under 35 USC 103.

In the claimed invention, a bolt (e.g., 113 in the disclosed exemplary embodiment) is used as a displaceable lid member to normally close/cover an opening (112 in the disclosed exemplary embodiment) in a casing (23 in the disclosed exemplary embodiment), as shown in Figs 4-5. When it is desired or necessary to manually release a parking brake state of the system (for maintenance, inspection or the like) the bolt is easily removed from an opening in the casing and a tool (116 in the disclosed exemplary embodiment) is inserted through the opening and connected to a tool connection portion (115 in the disclosed exemplary embodiment) at the rear portion of a locking piston (56 in the disclosed exemplary embodiment). This is a desirably simple arrangement which normally has essentially no effect on the operation or appearance of the parking brake system, but which can be easily effected by a mechanic or other person in the rare instances when it becomes necessary to manually release the parking brake state.

Conversely JP '903 discloses a self-locking pneumatic cylinder wherein a locking element (13) is supported on a carrier (12) within a cylinder housing and is radially displaceable between a locked position, in which a main working piston (6) is locked against movement in relation to the housing, and an unlocked position. The locking element is normally retained in a locking position by an auxiliary piston (16) except when the auxiliary piston (16) is displaced under pressure of fluid within a chamber (11). A spring (22) normally urges the auxiliary piston (16) toward the main piston order to keep the locking element (13) in a position to lock the main working piston (6), although fluid pressure may be applied in the chamber to overcome the force of the spring thereby displacing the auxiliary piston to unlock the locking element (13). Although it is not clear from the English abstract and drawings of JP '903, it appears that a screw rod (23) extends through a casing (15, 19) of the pneumatic cylinder, has one end fixed to the auxiliary piston, and an opposite end disposed outside of the casing such that it may be gripped and manually pulled to displace the auxiliary piston (16) in a rearward direction and permit the locking element to move radially to an unlocked position (Fig. 2).

Applicant respectfully submits that the screw rod (23) of JP '903, which remains fixed to the

auxiliary piston at all times, is significantly different than the present invention which includes the tool connection part at a rear portion of the lock piston and which is configured accommodate a tool inserted through an opening in the casing once the detachable lid member is removed. The screw rod (23) is subject to damage, wear-and-tear, etc. due to its permanent status as part of the pneumatic cylinder, and thus may become inoperable and/or affect the normal operation of the pneumatic cylinder, unlike the arrangement of the claimed invention.

Further, in the claimed invention, the tool connection part is formed by cutting an internal thread on a rear part of an inner face of a first communication passage formed in the locking piston. Thus, the tool connection part is formed by utilizing the first communication passage that communicates with the spring chamber, whereby machining of the tool connection part is relatively easy. See new claims 4, 5, 8, 12.

In contrast, in JP '903, the auxiliary piston 16 must be machined to have an axially extending bore for receiving the screw rod 23. JP '903 does not show or in any way suggest an idea of forming a communication passage and utilizing such communication passage to provide a part of receiving the screw rod 23.

Regarding the proposed use of the pneumatic cylinder of JP '903 in the parking brake system of Shirey, again, JP '903 discloses a self-locking pneumatic/hydraulic cylinder wherein the locking member automatically comes into its locked state when the main working piston moves in a forward direction, is retained in the locked state by the auxiliary piston, and is released from the locked state when fluid pressure moves the auxiliary piston in the forward direction away from the main piston. This is *contrary to and incompatible with* the parking brake system of Shirey in which a main / power piston 3 is normally actuated by a fluid pressure acting in a forward direction to engage a brake shoe 27 onto a wheel 28 of railroad car, and a locking piston 10 is actuated by fluid pressure acting in a rearward direction so as to force locking surfaces 6, 7 of a locking nut 5 and a locking member 8 into locking engagement.

Based on the actual disclosures of the references, it would not have been obvious to one of ordinary skill in the art at the time of the invention to combine the self-locking cylinder of JP '903 with the parking brake of Shirey because there is no reason to expect that the pneumatic cylinder of JP '903 would / could properly function as a parking brake in an application such as disclosed by Shirey.

Further, even if the teachings of the prior art references were hypothetically combined, as proposed by the Examiner, any hypothetical combination resulting from the actual teachings of the references still fails achieve or make obvious features required by present claim 1. Specifically, both JP '903 and Shirey fail to teach a tool connection part being provided in a rear portion of the locking piston which enables a tool to be inserted through an opening provided in the casing which can be detachably connected to the tool connection part.

Based on the foregoing, applicant respectfully submits that the Examiner's rejection over JP '903 and Shirey has been overcome in relation to present claim 1, and it is respectfully requested that such rejection be reconsidered and withdrawn.

OTHER MATTERS

The additional US Patent reference cited by the Examiner, US 7,434,669 to Halasy-Wimmer et al., has been considered by the applicant, but it is respectfully submitted that Halasy-Wimmer fails to overcome the deficiencies of the JP '903 and Shirey references relative to present claim 1 as discussed above.

New claims 2-12 are believed to be allowable based on the foregoing arguments concerning the merits of claim 1, and based on the merits of the additional features recited in the new claims. Again, for example, claims 4, 5, 8, 12 define that the tool connection part is formed by cutting an internal thread on a rear part of an inner face of a first communication passage formed in the locking piston. Thus, the tool connection part is formed by utilizing the first communication passage that communicates with the spring chamber, whereby machining of the tool connection part is relatively easy. This structure is not in any way suggested by the references of record.

CONCLUSION

Based on all of the foregoing, applicant respectfully submits that all of the objections and rejections set forth in the Office Action are overcome, and that as presently presented, all of the pending claims are believed to be allowable over all of the references of record, whether considered singly or in combination. The applicant requests reconsideration and withdrawal of the rejections of record, and allowance of the pending claims.

The application is now believed to be in condition of allowance and a notice to this effect is earnestly solicited.

If the Examiner is not fully convinced of the patentability of all of the claims now in the application, the applicant respectfully requests that the Examiner telephonically contact the applicant's undersigned representative to expeditiously resolve any issues remaining in the prosecution of the application.

Favorable consideration is respectfully requested.

Respectfully submitted,



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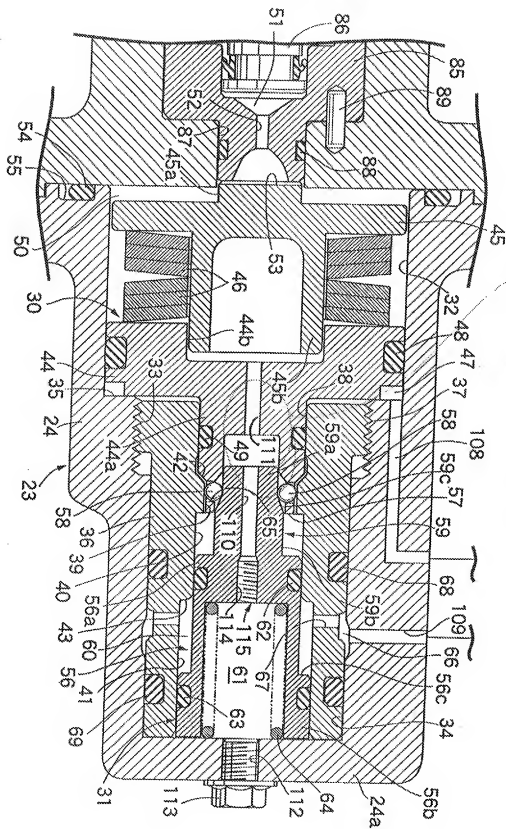


FIG. 4

*The head unit
 for control
 mounted in the
 front housing*